its resemblance to *Asterocrinites* of Münster, and proposed instead that of *Zygocrinus*. Römer, from the four-rayed structure of our *Astrocrinites*, allied it to the Cystoidea rather than to the Blastoidea. Prof. de Koninck and M. le Hon, however, referred *Zygocrinus* to the Blastoidea, and stated their reasons for so doing. Prof. Morris in 1854 altered Austin's *Astrocrinites* into *Astrocrinus*, and does not notice Bronn's name *Zygocrinus*. Prof. Pictet provisionally referred the latter genus structurally to *Codonaster*, noticing, however, its four instead of five pseudambulacra. The author then notices at some length the species he proposes to call *A. Benniei*, which appears to differ much from Austin's *A. tetragonus*. The body or calyx of *A. Benniei* is quadriradiate, having four convex lobes, three of which are alike, the fourth differing considerably from the others; the deep reentering angles between the lobes are occupied by the pseudambulacra; the dorsal surface is densely covered with closely set tubercles, but shows no point of attachment; the ventral surface is flattened, having a large central aperture, from which radiate the four pseudambulacra; excentric as compared with the ambulacral system is a second and pyriform aperture of complex structure. The component parts are then minutely described, followed by careful descriptions of the pseudambulacra, apertures, and ornamentation, also a discussion as to the presence of a madreporiform tubercle. The second part of the paper treats upon the affinities of *A. Benniei* (Ether.) with *A. tetragonus* (Austin). Part the third enters fully and critically into the systematic position of *Astrocrinites* amongst the Cystoidea and Blastoidea. In the concluding and fourth portion of the paper, the localities and geological horizons are given. Twenty-seven figures, occupying three plates, accompanied the paper.

MISCELLANEOUS.

On the Relations of Artemia salina *and* Artemia Mühlhausenii, *and on the Genus* Branchipus. By M. W. J. Schmankewitsch.

The author has observed that under the influence of a gradual concentration of the salt water in which *Artemia salina* lives that species is gradually modified, and at last acquires the characters of *A. Mühlhausenii*. In 1871 the salt marshes near Odessa contained *Artemia salina* in great abundance. At this time, in consequence of the rupture of a dyke, the quantity of salt contained in these pools was rather small, their water marking only 8° Baumé. After the dykes were repaired the concentration increased rapidly, so that in the summer of 1872 the water already marked 14°; in 1873 it had risen to 18°; at the beginning of August 1874 to 23°·5, and in September of the same year it had attained 25°. At the same time that the salting became stronger and stronger, the *Artemia salina* was modified from generation to generation to such an extent that, at the end of the summer of 1874, a great portion of the individuals of this species no longer had caudal lobes, and already presented all

the specific characters of *A. Mühlhausenii*. The author minutely describes the gradual changes that he observed. These were manifested especially in the caudal part, and were accompanied by a diminution of size.

These observations, made upon animals living at freedom in salt marshes, are corroborated by experiments made by the author upon *Artemiæ* reared in captivity in water of which the saltness was gradually increased. Under these conditions he observed the same transformations leading to the same forms.

The inverse experiment was tried with *Artemia Mühlhausenii* taken in the salt marshes and reared in water rendered less and less salt. This *Artemia* was then seen to retrograde by degrees towards the form of *Artemia salina*.

In proportion as the saltness increases or diminishes a correlative increase or diminution of the surface of the branchiæ is observed in the *Artemiæ*. The form of these organs also differs in the two species; those of *Artemia salina* are of an elongated form, their two dimensions being in the proportion of one to two, whilst those of *A. Mühlhausenii* are oval, and their two dimensions are in the proportion of two to three.

According to M. Schmankewitsch, the only(?) anatomical character that distinguishes the genus *Branchipus* from *Artemia* is that in the latter we count (including the two segments which bear the external sexual organs) eight apodal terminal segments, the last of which is nearly twice as long as the preceding one; whilst in *Branchipus* there are nine apodal segments, the last two of which differ but little from each other in length. When a series of generations of *Artemia* have been reared in water less and less salt, the last segment (8th) divides into two, when there are nine apodal segments as in *Branchipus*. Moreover it must be noted that in youth, at the moment when they have just quitted the larval state, the *Branchipodes* have only eight apodal abdominal segments, the last of which has the same proportions as in *Artemia*.

It is not only by the number of abdominal segments that the *Artemiæ* approach *Branchipus* under the influence of the surrounding medium; other characters which the former genus borrows from the second also make their appearance; this is the case, for example, with the length of the caudal lobes, the number of setæ they bear, &c.

The results of these observations lead the author to the conclusion that the *Artemiæ* which ordinarily pass their lives in strong salt water are merely degraded forms of *Branchipodes*, produced under the influence of the surrounding medium. Inversely we may suppose that the *Branchipodes* represent a form more advanced in development than the *Artemiæ*.

The facts contained in M. Schmankewitsch's memoir appear to be well observed, and possess great interest from the point of view of the theory of transformism. We cannot, however, abstain here from making one or two critical remarks:—first, that the author makes no allusion to a rather important character which separates

Artemia salina from *A. Mühlhausenii*, namely the different form of the lower antennæ, which in the former species presents an inflation wanting in the second; secondly, M. Schmankewitsch seems to assume that *Artemia* is distinguished from *Branchipus* only by the number of abdominal segments, and he does not mention the very marked differences presented by the inferior antennæ in the two genera. Lastly, it is rather difficult to understand whether the modifications which cause *Artemia salina* to pass into *A. Mühlhausenii* make their appearance sooner or later than, or at the same with, the modifications which approximate the genus *Artemia* to the genus *Branchipus*.—*Zeitschr. für wiss. Zool.* xxv. Suppl. i. 1875, p. 103, pl. 6; *Bibl. Univ. Arch. des Sci.* liv. Nov. 15, 1875, p. 284.

The Drosera *as an Insect-catcher.* By Thomas Meehan.

Mr. Thomas Meehan referred to a discussion before the Academy recently in which the question occurred, whether those plants which had contrivances for catching insects made any nutritive use of the insects so caught. It had been argued from experiments made in England with plants under bell-glasses and free from insects which were quite as healthy as those which had had insects regularly supplied to them, that the plants were not actually insect-eaters.

In a recent botanical trip to New Jersey he had found in Atlantic County, about five miles from Hammonton, three species of *Drosera* (*D. filiformis, D. longifolia*, and *D. rotundifolia*), all growing near each other in immense quantity. All of these species had insects of numerous kinds attached to them. Large numbers of plants had no insects. The species with the largest number of plants having insects on them were in the order as above named. The insects are held by the pin-like glandular hairs, which seem to lean in from all sides towards the insect (as if, from its struggles to escape, drawn in) and thus securely hold it. The remains of the insects which have been caught seem to continue attached to the plant for a long time; and thus can be seen which plant has had the benefit of insect-food, if food it be. No difference, however, in health or vigour could be traced between those which had had insects and those which had had none. Mr. Meehan did not, however, think that these observations, or experiments founded on any thing they suggested, would settle the question of nutrition. Among ourselves there were discussions as to whether people were healthier as vegetarians or flesh-eaters, while figures showed little difference, if any, either way. A plant might feed on insects when it could get them, and yet be no healthier than those which had to get along as other plants did. It was necessary, however, to the theory advanced by those who believed the insect-catching were really insect-eating plants, to show that some superior advantages favoured the insect-catchers. It was believed that the power to catch insects was a developed one, a power not possessed by their predecessors, and developed according to the law of natural selection. Unless insect-catching can be shown to be an especial advantage, there was nothing to select. At any rate, his observations on the *Drosera* only showed